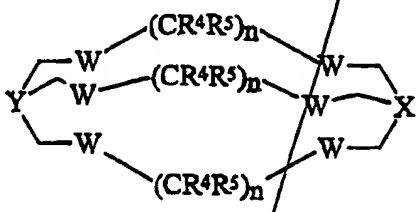
AMENDED CLAIMS

[received by the International Bureau on 08 May 2000 (08.05.00);
original claims 1-24 replaced by new claims 1-23 (5 pages)]

1. A compound which is capable of being radiolabelled of general formula (I) which is as follows:



(I)

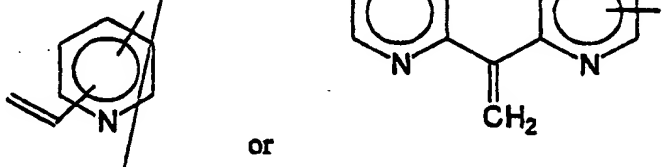
in which n represents an integer from 2 to 4,

where each R^4 and R^5 is independently selected from -H, CH_3, COOH, NO_2, CH_2OH, H_2PO_4, HSO_3, CN, $C(=O)NH_2$ and CHO;

X and Y are the same or different and are selected from the group consisting of C-R, N, P and C-Z in which R is selected from hydrogen, halogen, hydroxyl, nitro, nitroso, amino, optionally substituted alkyl, optionally substituted aryl, optionally substituted aralkyl, cyano, COOR', COCOOR', NH-$COCH_2Br$ and -NH-CO-CH=CH-COOR' in which R' is a hydrogen atom or alkyl group;

W is selected from the group consisting of NH, S and O; and

Z is a functionalised linkage group which is capable of binding said compound of formula (I) to a molecular recognition unit, selected from the group consisting of $C(=NH)OR^2$, NCO, NCS, SR^2, $NHNR^2R^3$, $NHCONHNR^2R^3$, $NHCSNHNR^2R^3$, $CONR^2R^3$, NR^2R^3, $(CH_2)_pR^6$, $(CH_2)_pArR^1$, $(CH_2O)_pCH_2R^1$, $(CH_2OCH_2O)_qArR^1$, $(CHCH)_rR^1$, $(CHCH)_rArR^1$, maleimide, a vinyl pyridyl group of formula



or

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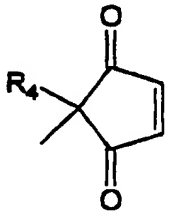


and a substituted vinyl group of formula Het^1-C(Het^2)=CH_2, where Het^1 and Het^2 are the same or different and each is a nitrogen containing heterocyclic group or Het^1 is a nitrogen containing heterocyclic group and Het^2 is H; where

R^2 and R^3 are the same or different and are independently selected from H, $(CH_2)_pR^1$, $(CH_2)_pArR^1$, $(CH_2O)_pCH_2R^1$, $-(CH_2OCH_2O)_qArR^1$, $(CHCH)_rR^1$ and $(CHCH)_rArR^1$, with the proviso that when R^2 is H, R^3 is not H;

R^1 is selected from SH, OH, NH_2, COOH, NCS, -N=N, or $-C(=NH)OCH_3$ and, COR", where R" is H, halogen, N_3, alkoxy, OAr, imidyloxy, imidazoyloxy, alkyl, or alkyl substituted with a halogen or other leaving group; and

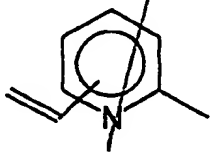
R^6 is selected from SH, NH_2, COOH, NCS, -N=N, or $-C(=NH)OCH_3$ and, COR"; and

p is an integer from 1 to 20, q is an integer from 1 to 20, r is an integer from 1 to 4, and Ar is optionally substituted aryl or optionally substituted aralkyl; and wherein

at least one of X and Y is C-Z, or a pharmaceutically acceptable salt thereof.

2. A compound according to claim 1 wherein the molecular recognition unit is selected from the group consisting of an antibody, protein, peptide, carbohydrate, nucleic acid, oligonucleotide, oligosaccharide and liposome.

3. A compound according to claim 1, wherein the functionalised linkage group Z of the compound of Formula (I) is a vinyl pyridyl group of formula



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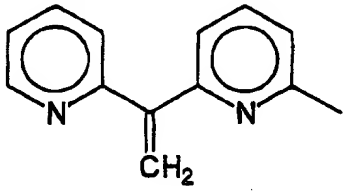
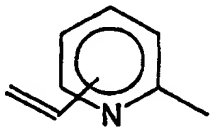
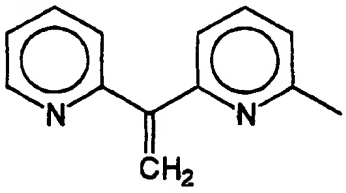


4. A compound according to claim 1, wherein the functionalised linkage group Z of the compound of Formula (I) is selected from





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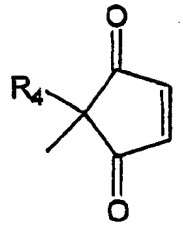


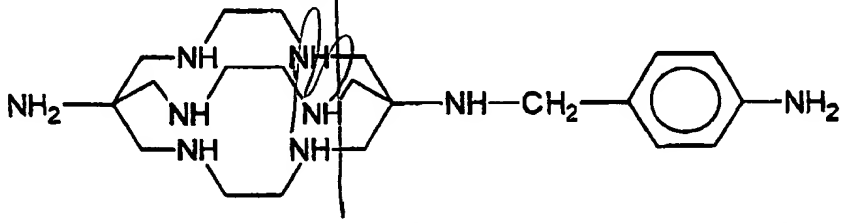
, and

NR^2R^3 where R^2 and R^3 are the same or different and are independently selected from H, $(CH_2)_pR^1$, $(CH_2)_pArR^1$, $(CH_2O)_pCH_2R^1$, $-(CH_2OCH_2O)_qArR^1$, $-(CHCH)_rR^1$, and $(CHCH)_rArR^1$, with the proviso that when R^2 is H, R^3 is not H, and where R^1 is selected from NH_2, COOH, NCS, NCO, -N=N, $-C(=NH)OCH_3$, and COR" where R" is H, halogen, alkyl, or alkyl substituted with a halogen or other leaving group, where p is an integer from 1 to 20; q is an integer from 1 to 20; r is an integer from 1 to 4; and Ar is optionally substituted aryl or optionally substituted aralkyl, provided that at least one of R^2 and R^3 is other than hydrogen.

5. A compound according to claim 1, wherein W is NH and Z is selected from NR^2R^3 where R^2 and R^3 are the same or different and are independently selected from H, $(CH_2)_pR^1$, and $(CH_2)_pArR^1$, with the proviso that when R^2 is H, R^3 is not H; R^1 is selected from NH_2, COOH and NCS; and p is an integer from 1 to 4.

6. A compound according to claim 4, wherein the Z group of said compound of Formula (I) is NR^2R^3 where R^2 and R^3 together with the nitrogen atom to which they are attached form an optionally substituted saturated or partially unsaturated ring optionally containing one or more further heteroatoms O, S or N whereby there is at least one substituent capable of binding said compound of Formula (I) with a molecular recognition unit.

7. A compound of Formula (I) having the following structure:



8. A compound according to claim 1, wherein said compound is complexed with a metal ion.

9. A compound according to claim 8 wherein the metal ion is selected from Cu, Tc, Gd, Ga, In, Y, Co, Re, Fe, Au, Ag, Rh, Pt, Bi, Cr, W, Ni, V, Pb, Ir, Pt, Zn, Cd, Mn, Ru, Pd, Hg, Ti, and the lanthanide group of elements in the Periodic Table such as Sm, Ho, Gd, Tb, Sc.

10. A compound according to claim 9 wherein the metal ion is a radionuclide selected from the group of Cu, Cu, Tc, In, Gd, Ga, Fe, Cu, Ti and other radionuclides from the Lanthanides, Re, Sm, Ho, and Y .

11. A compound according to claim 10 wherein the radionuclide is selected from ^{64}Cu and ^{67}Cu.

12. A pharmaceutical formulation comprising a compound according to claim 1, a radiolabelled complex or pharmaceutically acceptable salt thereof together with a pharmaceutically acceptable carrier.

13. A diagnostic formulation comprising a compound according to claim 1, a radiolabelled complex or pharmaceutically acceptable salt thereof and a reducing agent in a pharmaceutically acceptable carrier.

14. A method of diagnosis or therapy in a subject comprising administering to the subject a diagnostically or therapeutically effective amount of a compound of Formula (I) according to claim 1 or a metal complex, radiolabelled complex or a pharmaceutically acceptable salt thereof.

15. Use of a compound according to claim 1 or a metal complex, radiolabelled complex or pharmaceutically acceptable salt thereof in the preparation of a medicament for diagnosis or therapy of disease in a subject.

16. A compound according to claim 1 or a metal complex, radiolabelled complex or pharmaceutically acceptable salt thereof when used in the diagnosis or therapy of disease in a subject.

17. A conjugate compound comprising at least one compound of Formula (I) according to claim 1 or a metal complex, radiolabelled complex or a pharmaceutically acceptable salt thereof bonded to at least one molecular recognition unit comprising an antibody, protein, peptide, carbohydrate, oligonucleotide, oligosaccharide.

18. A method of diagnosis or therapy in a subject comprising administering to the subject a diagnostically or therapeutically effective amount of a conjugate compound according to claim 17.

19. Use of a conjugate compound according to claim 17 in the preparation of a medicament for diagnosis or therapy of disease in a subject.

20. A conjugate compound as described in claim 1 when used in the diagnosis or therapy of disease in a subject.

21. A method of imaging a subject comprising introducing a compound of Formula (I) according to claim 1 or a metal complex, radiolabelled complex, conjugate compound or pharmaceutically acceptable salt thereof to a subject.

22. Use of a compound of Formula (I) according to claim 1 or a metal complex, radiolabelled complex, conjugate compound or pharmaceutically acceptable salt thereof in the preparation of a medicament for imaging in a subject.

23. A compound of Formula (I) according to claim 1 or a metal complex, radiolabelled complex, conjugate compound or pharmaceutically acceptable salt thereof when used in imaging in a subject.

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